REMARKS

Claims 1-6, 14-16, 19-22, 25 and 41-47 are all the claims presently pending in the application. Claims 1-3 and 14-16 have been amended to more clearly define the invention. Claims 44-47 have been added to claim additional features of the claimed invention.

The claim amendments are made only to more particularly point out the invention for the Examiner and not for narrowing the scope of the claims or for any reason related to a statutory requirement for patentability. Applicants also note that, notwithstanding any claim amendments herein or later during prosecution, Applicants' intent is to encompass equivalents of all claim elements.

Claims 1-6, 14-16, 19-22, 25 and 41-43 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Stephens et al. (U. S. Pat. No. 6,563,614).

This rejection is respectfully traversed in the following discussion.

I. THE CLAIMED INVENTION

An exemplary embodiment of the claimed invention, as defined by, for example, independent claim 1, is directed to an optical communication system for amplifying an optical signal propagating through a front optical transmission line mounted at a front stage by using an optical amplifier in an optical repeater and emitting the amplified optical signal to a back optical transmission line mounted at a back stage. The system includes a transmission line compensating device to generate control light which is input to one of the front and back optical transmission lines to produce a Raman amplification effect within the one of the front and back optical transmission lines outside of the optical repeater based on a control signal corresponding to an optical signal level input from the front optical transmission line.

Importantly, the optical amplifier is disposed between the transmission line compensating device and the other one of the front and back optical transmission lines (Application at page 8, line 4-page 9, line 8; Figure 1).

Conventional optical communication systems have optical signal characteristics which are affected by leakage of pumping light emitted from an optical repeater and a loss spectrum

that is exhibited intrinsically by the optical transmission line. As the number of wavelength-multiplexed signals increase, it becomes more difficult to properly calibrate a difference in output of each signal.

The claimed optical communication system, on the other hand, has a transmission line compensating device to generate control light which is input to one of the front and back optical transmission lines to produce a Raman amplification effect within the one of the front and back optical transmission lines, and an optical amplifier which is disposed between the transmission line compensating device and the other one of the front and back optical transmission lines (Application at page 8, line 4-page 9, line 8; Figure 1). That is, in the claimed invention **the optical amplifier may be located between the transmission line compensating device and the transmission line which is other than the one in which the control light is input**. This allows the claimed invention to properly control an output of an optical signal and a loss spectrum exhibited by the optical transmission, thus enabling a high quality optical transmission line to be implemented (Application at page 11, lines 13-18).

II. THE ALLEGED PRIOR ART REFERENCE

The Examiner alleges that the Stephens teaches the invention of claims 1-40. Applicant submits, however, that Stephens does not teach or suggest each and every element of the claimed invention.

Stephens discloses an optical transmission system which includes an optical signal controller 12 for controlling a characteristic of an optical signal passing between two nodes 14 (Stephens at col. 6, lines 15-19; Figures 1-3). The controller 12 includes an optical compensation source 30 which provides power in a compensating channel λ_{ci} which is combined with an optical signal channel λ_i (Stephens at col. 7, lines 4-7).

However, Applicant respectfully submits that Stephens does not teach or suggest a transmission line compensating device which includes "*wherein said optical amplifier is disposed between said transmission line compensating device and the other one of said front and back optical transmission lines*", as recited, for example, in claim 1, and similarly recited in

claims 14 and 20.

That is, in the claimed invention **the optical amplifier may be located between the transmission line compensating device and the transmission line which is other than the one in which the control light is input** (Application at page 8, line 4-page 9, line 8; Figure 1; Figure 4). This allows the claimed invention to properly control an output of an optical signal and a loss spectrum exhibited by the optical transmission, thus enabling a high quality optical transmission line to be implemented (Application at page 11, lines 13-18).

Clearly, this feature is not taught or suggested by Stephens. Indeed, the Examiner alleges that Stephens discloses in Figure 4 that the "optical amplifier" 36 is disposed between the alleged transmission line compensating device (e.g., optical receiver 24, source controller 32, and compensation sources 30) and the other one of the front and back optical transmission line 18, wherein the transmission line compensating inputs control light to one of the front and back optical transmission lines to produce a Raman amplification effect.

Applicant respectfully submits that the Examiner appears to misinterpret Figure 4 in Stephens.

In fact, Figure 4 in Stephens teaches that the optical amplifier 36 is disposed between the alleged transmission line compensating device (e.g., optical receiver 24, source controller 32, and compensation sources 30) and transmission line 18 via optical node 14. However, nowhere does Figure 4 in Stephens teach or suggest that the optical amplifier 36 is disposed between the alleged transmission line compensating device and **the transmission line which is other than the one in which a control light is input** (Applicant notes that Figure 4 depicts an optical distributor 28 (i.e., not an optical combiner 28), an optical combiner 26 (i.e., not an optical distributor 26), and optical receiver 24, a source controller 32 and an optical compensation source 30).

Indeed, Applicant respectfully submits that the Examiner misunderstands the direction of travel of the optical signal in the Stephens system. That is, contrary to the Examiner's understanding regarding the Stephens system, the optical signals in the Stephens system travel only in the direction from the alleged transmission line compensating device to the optical

combiner 26 and then to the optical distributor 28 and optical amplifier 36 before being emitted onto transmission line 18 via node 14. Attached hereto and incorporated by reference herein is an annotated Figure 4 from Stephens, on which Applicant has indicated the direction of travel of the optical signals in the Stephens system for the Examiner's convenience.

Therefore, even assuming that the optical compensating source 30 generates an alleged "control light" (e.g., control channel wavelengths, λ_{ci}) which is input to an optical transmission line, as alleged by the Examiner, it is abundantly clear that the alleged control light is input to the transmission line 18 which is on the side of the optical amplifier 36. That is, the optical amplifier 36 is **NOT** disposed between the alleged transmission line compensating device and **the transmission line which is other than the one in which a control light is input**. Therefore, the Stephens system is completely different from and operates in a completely different manner than the claimed invention.

Indeed, Applicant would **again** point out to the Examiner that in Stephens, a Raman amplification effect by a control light is **NOT** produced within an optical transmission line, but in a component device of a Raman amplifier 36 (Stephens at Figure 4; col. 8, lines 2-3). Further, the control light is not input to the optical transmission line through the Raman amplifier 36, but instead the output from the Raman amplifier 36 to the optical transmission line is not an optical signal including a control light, but an amplified optical signal as amplified by the control light.

In contrast, in the claimed invention, a Raman amplification effect by a control light may be produced within an optical transmission line over a great distance (e.g., not necessarily in an optical amplifier such as the Raman amplifier 36 in Stephens). Therefore, the control light is input to an optical transmission line which is **other than the optical transmission line via an optical amplifier.**

Therefore, Applicant respectfully submits that Stephens does not teach or suggest each and every element of the claimed invention. Therefore, the Examiner is respectfully requested to withdraw this rejection.

III. FORMAL MATTERS AND CONCLUSION

In view of the foregoing, Applicant respectfully submits that claims 1-6, 14-16, 19-22, 25 and 41-47, all the claims presently pending in the Application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the Application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

Date: 2/15/06

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CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that the foregoing was filed by facsimile with the United States Patent and Trademark Office, Examiner Dzung Tran, Group Art Unit # 2633 at fax number (571) 273-8300 this 15th day of February, 2006.

Phillip E. Miller
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